

Agenda



- Welcome
- Navy Presentation
 - Environmental Restoration
 - Per- and Polyfluoroalkyl Substances (PFAS)
- USGS Presentation
- Air National Guard Presentation
- EPA/Regulator Update
- Questions
- RAB meeting adjournment



RAB Meeting Background



- A Restoration Advisory Board (RAB) is a stakeholder group that meets on a regular basis to discuss environmental restoration at a specific property that is either currently or was formerly owned by Department of Defense (DoD), but where DoD oversees the environmental restoration process.
- RABs enable people interested in the environmental cleanup at a specific installation to exchange information with representatives of regulatory agencies, the installation, and the community.
- RABs may only address issues associated with environmental restoration activities.
- Health related issues are not addressed by the RAB. Health agency professionals will be available after the Navy and Air National Guard Environmental Restoration presentations.

Source: DoD RAB Rule Handbook

3



NASJRB Willow Grove



Environmental Restoration Status

4



Site 3 and Site 12 Landfills



- Two former landfills, Remedial Investigations showed:
 - elevated levels of metals and PAHs in surface and subsurface soils.
 - Site 3 groundwater has low levels of PCE.
- Feasibility Studies (FS) status.
 - August 29, 2019 - Final Site 3 FS completed.
 - August 30, 2019 - Final Site 12 FS completed.
 - Documents will be available in the administrative record



Site 3 and Site 12 Landfills (cont.)



- Proposed Remedial Action Plans (PRAPs) under review by EPA and PADEP.
 - May 13, 2019 - Draft-Final Site 3 PRAP submitted. EPA/PADEP comments provided.
 - August 28, 2019 - Draft Site 12 PRAP submitted.
- PRAP Public Comment period
 - A public meeting will be held during the 45 day public comment period.
 - Tentatively scheduled for late 2019.



Site 5 – Fire Training Area Groundwater



Site 5 Groundwater Remedial Action



- Anaerobic bioremediation system continues to operate successfully.
- Annual performance monitoring is being conducted in accordance with approved Operation, Maintenance, and Monitoring Plan.
 - May 2019 - Annual performance monitoring was performed.
 - August 2019 - Additional injections of amendments was started and will continue through October 2019.
- Results continue to show good conditions for biodegradation of volatile organic compounds (VOCs) and decreasing trends of VOCs.



NASJRB Willow Grove



Per- and Polyfluoroalkyl Substances (PFAS) Status

9



Summary of Drinking Water Actions



- The Navy has provided funds to HWSA for filtration system costs and drinking water connections above the HA. The total funding is over \$18 million. Additional funds were provided in 2019.
- The Navy has funded filtration systems at five Horsham Water and Sewer Authority (HWSA) public wells (#10, 17, 21, 26, and 40) which were found to be above the HA. All are back to drinking water service.

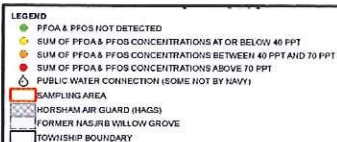
Private well sampling	Feb 2017	Current
Private wells sampled for PFOA/PFOS *	490	512
Private wells above lifetime HA (>70 ppt)	89	100
Private wells not yet connected	27	7 **
Private wells below HA/monitored (>40 ppt)	70	60

* Includes 47 wells sampled in Warrington, now managed by Air National Guard

** Of these, two (2) are currently being scheduled

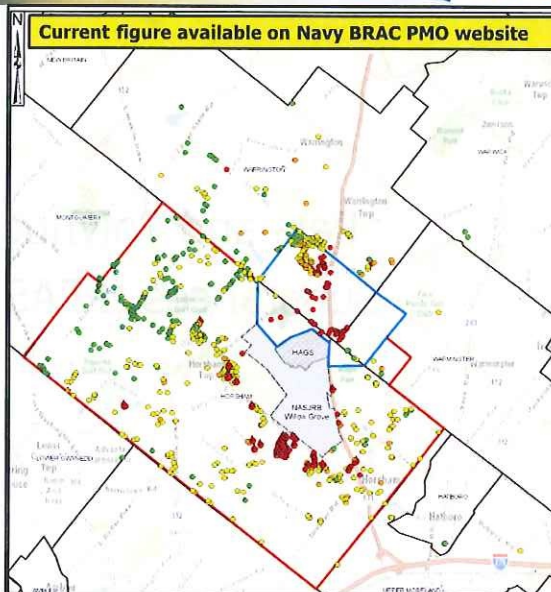


Private Drinking Water Well Sampling Area



Private drinking water well sampling for PFOA/PFOS and provision of bottled drinking water is being performed by Tetra Tech, a U.S. Navy contractor.

Point-of-contact is:
Tricia Moore,
Tetra Tech Project Manager
tricia.moore@tetratech.com
Phone: (610) 382-1171



Private Drinking Water Well Sampling



- The Navy is re-sampling most private drinking water wells, within the sampling area, that are not being regularly monitored.
 - Obtains updated information and to ensure protectiveness.
 - The wells closest to NASJRB Willow Grove were sampled first.
 - Tetra Tech is contacting property owners to schedule sampling.
 - Re-sampling expected to complete in early 2020.



Phase I PFAS Investigation



- The Navy is performing a Remedial Investigation (RI) to better understand the nature and extent of the PFAS contamination, and facilitate evaluation of potential remedies.
- Draft Phase I RI Report issued for regulatory review December 2018 with a copy provided to Horsham Township Library. Report identifies data gaps for further investigation, including potential migration pathways via storm water systems. Final report expected in October 2019.

Horsham Township Library Information Repository
<http://oldhtl.mclinc.org/WillowGroveNASindex.html>

13



Phase I PFAS Investigation Stormwater System Evaluation



- The NASJRB storm water system was evaluated to locate portions where PFAS impacted groundwater may infiltrate and discharge to local surface water. Over two miles of storm sewer lines reviewed, using remote video inspections in the fall of 2018.
- A technical memorandum identifying leaking storm sewer lines was completed in March 2019. A copy was provided to the Horsham Township Library.
- The Navy has awarded a contract to carry out the report recommendations. Work expected to commence in Fall 2019.
- Video inspection of additional sections planned for Fall 2019.

14



Phase II PFAS Investigation



- Scoping Sessions with PADEP and EPA held in December 2018 and January 2019.
- The Phase II investigation includes, but is not limited to:
 - Evaluation of groundwater extraction and treatment systems using pilot test information.
 - Periodic surface water monitoring.
 - Additional monitoring wells and soil sampling in source areas.
 - Further evaluation of on-base storm water systems.
 - Off-base monitoring wells

15



Phase II PFAS Investigation Surface Water Sampling



- The Navy has prepared a sampling and analysis plan (SAP) for monitoring off-site surface waters and sediment that may be impacted by PFAS from former NASJRB Willow Grove.
- First round of surface water and sediment monitoring was performed in July 2019, with support from the USGS. Drinking water purveyors were invited to participate. Sampling results are currently being validated.
- Navy is funding USGS to install additional stream gages to assess mass loading.
- The Navy will sample quarterly for a year and will coordinate future surface sampling with the Air National Guard.

16



Phase II PFAS Investigation Groundwater Treatment Pilot Tests



Pilot Test at former Aircraft Maintenance Hangar 680

- Final Work Plan was submitted March 20, 2019
- Pilot test progress:
 - September 3, 2019 - PADEP discharge approval.
 - September 6, 2019 - Construction completed.
 - September 10, 2019 - Startup testing initiated. Treated water stored until confirmation of discharge rqmts.
 - Full-time operations will commence upon laboratory confirmation and PADEP concurrence that system is operating as designed.
 - Tentatively scheduled for late September 2019.
 - System will operate for an initial 6-month period.
- Pilot test provides groundwater and treatment information for design of a full-scale system.

17



Pilot Test Treatment System



18



Pilot Test Layout



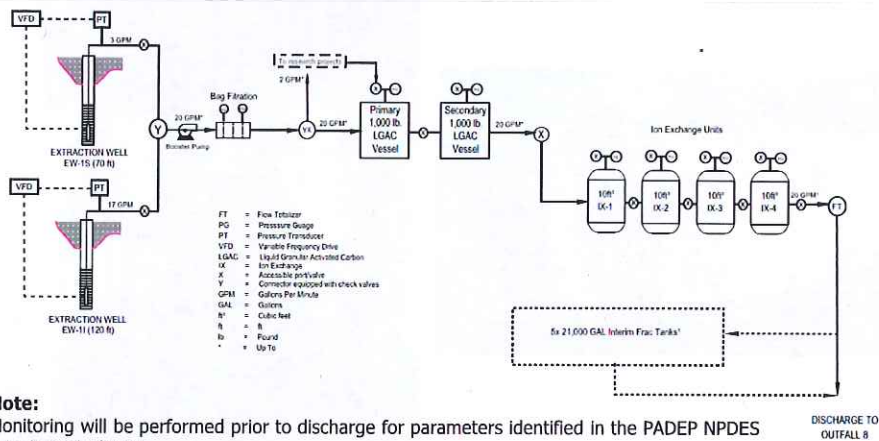
19



Pilot Test Treatment Process



Treatment Direction



Note:

Monitoring will be performed prior to discharge for parameters identified in the PADEP NPDES permit equivalency.

(1): Frac tanks will be utilized to hold the treated water while awaiting initial laboratory results to confirm discharge limits are met.

20



Phase II PFAS Investigation Groundwater Treatment Pilot Tests



Pilot Test at former Fire Training Area (Site 5)

- The former fire training area (site 5) has elevated levels of PFOA and PFOS in the groundwater, and is a likely source area due to historical activities.
- An in-situ bio-stimulation remedy is operating successfully to reduce VOCs.
 - PFAS treatment cannot interfere with that remedy.
 - Extraction wells will likely be between the VOC plume and the base boundary.
- Lessons learned from the Hangar 680 pilot test will be used to prepare the draft work plan, which is anticipated by December 2019.

21



Phase II PFAS Investigation



Other plans in development:

- Draft Sampling and Analysis Plan (SAP) for on-base groundwater wells – expected in early 2020.
- Draft Sampling and Analysis Plan (SAP) for off-site groundwater monitoring wells.
 - Draft prepared July 2019.
 - Comments received and being reviewed.

22



Participation in DoD Funded PFAS Research



- SERDP/ESTCP are DoD-funded environmental research programs.
- NASJRB Willow Grove is supporting ~\$8M of SERDP/ESTCP funded research investigating new PFAS assessment and remediation technologies.
- Will continue to seek participation in additional SERDP/ESTCP work at NASJRB Willow Grove or nearby NAWC Warminster.
- Participate in other Navy or USEPA funded research.

SERDP/ESTCP Projects and organizations leading the research:

- **Soil or Groundwater Treatment**
12 Total Projects Participated
Projects Since Last RAB
ER-1026 – Cornell University
ER-1497 – Univ. of CA Riverside
ER-1491 – Univ. of Illinois at Chicago
ER18-1300 –College of Wooster
Working with College on field column study on new adsorptive resin.
- **Passive Treatment of Storm Water**
ER18-1230 –Oregon St. Univ.
- **Assessment of Fate and Transport of PFAS in Surface Water**
ER19-1073 (New Start) –Academy of Natural Sciences of Drexel University
ER19-1193 (New Start and potential participation) –Towson State University

DoD's SERDP/ESTCP PFAS website:

http://serdp-estcp-pfas.com/pfas_efforts/pfas_efforts.pdf

23



Action Summary since previous RAB



ACTIONS COMPLETED

- Final Site 3 and Site 12 FS completed.
- Draft Site 12 PRAP provided to regulators.
- First round of surface water and sediment monitoring completed.
- Hangar 680 pilot test construction completed, startup initiated.
- Draft SAP for off-site monitoring wells completed.
- Soil disposal – In July 2019, approx. 4,500 tons of PFAS were disposed at a RCRA* subtitle D non-hazardous waste lined landfill.

* Resource Conservation Recovery Act

24



Action Summary since previous RAB



ACTIONS SOON TO BE COMPLETED

- Final Site 3 and 12 Proposed Plans submitted to regulators.
- Site 3 and 12 proposed plan public meeting.
- Second round surface water and sediment monitoring.
- Draft work plan - pilot test at Former Fire Training Area (Site 5).
- Final Phase I PFAS Remedial Investigation report.

25



NASJRB Willow Grove



- Next RAB Meetings
 - December 4, 2019 @ 2:00 p.m. (Wed.)
 - March 2020 (date/location TBD)
 - May/June 2020 (date/location TBD)

26



NASJRB Willow Grove

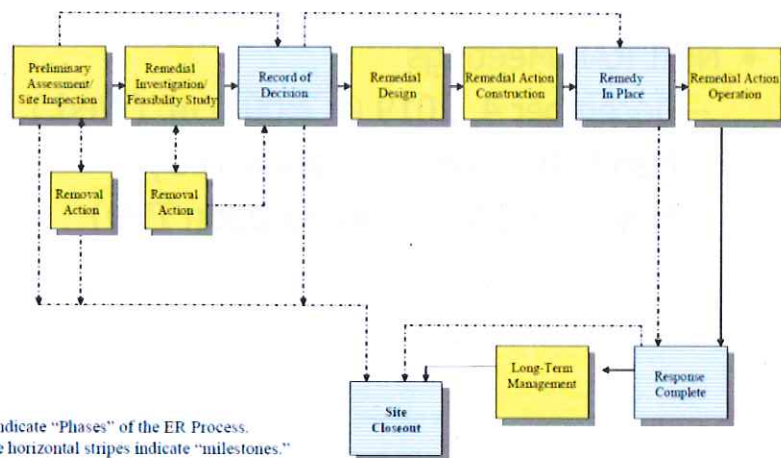


Back-up / Additional Information

27



Environmental Restoration Program



Notes:

Yellow boxes indicate "Phases" of the ER Process.
Boxes with blue horizontal stripes indicate "milestones."

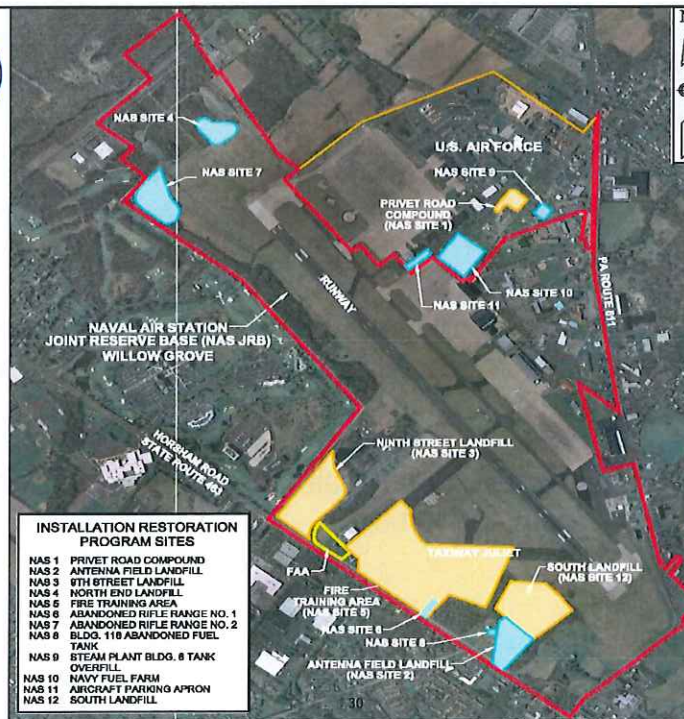
28



Environmental Restoration Sites



Site	Name	Operable Unit (OU)	Status
2	Antenna Field Landfill	Soil - OU 5 Groundwater - OU 9	No Action ROD Signed June 17, 2010
3	Ninth Street Landfill	Soil - OU 6 Groundwater - OU 10	RI Completed Oct. 2011/FS Pending
4	North End Landfill	...	Consensus Agreement for No Action Jan. 2009
5	Fire Training Area	Soil - OU 4 Groundwater - OU 2	Soil (OU 4) NFA ROD signed Sept. 2007 Groundwater (OU 2) ROD signed Sept. 2012 Groundwater (OU 2) RACR Signed Sept. 2014 Groundwater (OU 2) Final OPS and OM&M Plan May 2015
6	Abandoned Rifle Range No. 1	...	Consensus Agreement for No Action Dec. 2007
7	Abandoned Rifle Range No. 2	...	Consensus Agreement for No Action Aug. 2008
8	Building 118 Abandoned Fuel Tank	...	NFA Agreement Oct. 2006
SSA 11	Aircraft Parking Apron	...	Eliminated From Consideration
12	South Landfill	OU 11	Final RI Feb. 2014, FS to follow
PFCs/PFAS	Perfluorinated Compounds/Per- and Polyfluoroalkyl substances	OU 12	TCRA Sept. 2015, Final PA/SI Mar. 2016, RI in progress.





PFOA / PFOS Background



- In mid-2014, PFCs known as Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) were found in public drinking water wells near NASJRB Willow Grove through an EPA program known as the Unregulated Contaminant Monitoring Rule (UCMR).
- The health advisory levels at that time were 0.4 micrograms per liter ($\mu\text{g/L}$), or 400 parts-per trillion (ppt), for PFOA and 0.2 $\mu\text{g/L}$, or 200 ppt, for PFOS.
- PFOA/PFOS are man-made chemicals used in many products, including fire-fighting solutions known as aqueous film-forming foam (AFFF), which were used at NASJRB Willow Grove.
- In the summer of 2014, the Navy began sampling for PFOA/PFOS in private drinking water wells and worked with Horsham Water and Sewer Authority (HWSA) on the municipal drinking water wells.

31



PFOA / PFOS Background (cont.)



- In May 2016, the Environmental Protection Agency established a lifetime Health Advisory (HA) level of 70 parts-per-trillion ($0.07 \mu\text{g/L}$) for combined PFOA and PFOS.
- The Navy's priority continues to be eliminating exposure to PFOA/PFOS above health advisory levels in drinking water.
- Any health concerns should be addressed with your health professional. Weblinks to health information is provided at the end of this presentation.

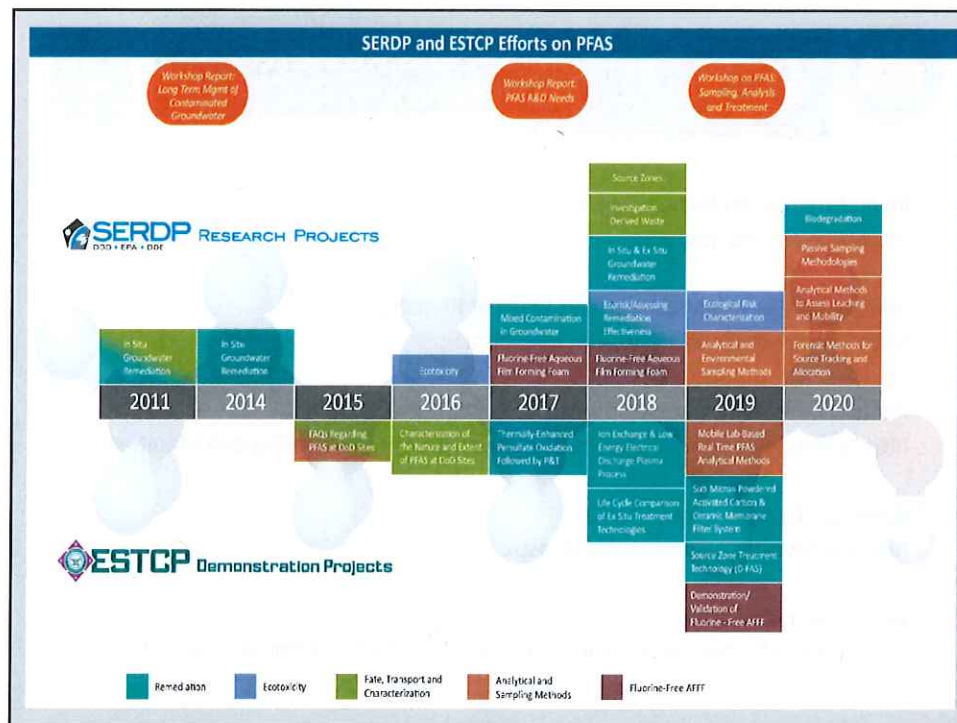
32



PFAS Removal Action



- Soils with high levels of PFAS were excavated between November 2018 and January 2019.
- Excavation areas were adjacent to fire station and Hangar 175.
- The Time-Critical Removal Action Memorandum and work plan are available in the administrative record and the Horsham library.
- Excavation was backfilled to grade with clean fill material that was tested prior to use.





PFAS Information and Resources



Department of the Navy (DON) Perfluorinated Compounds (PFC) /
Perfluoroalkyl Substances (PFAS) website

<http://www.secnav.navy.mil/eie/pages/pfc-pfas.aspx#>

NAVFAC BRAC PMO Websites (includes links to environmental
information and the administrative record):

- http://bracpmo.navy.mil/brac_bases/northeast/reserve_base_willow_grove/documents.html
- http://bracpmo.navy.mil/brac_bases/northeast/former_warfare_center_warminster/documents.html

***A subscription service is available on these websites to receive e-mail
notification of new information.***



PFAS Information and Resources (continued)



Environmental Protection Agency

<https://www.epa.gov/pfas>

Agency for Toxic Substances and Disease Registry

<https://www.atsdr.cdc.gov/pfc/index.html>

Pennsylvania Department of Environmental Protection

http://www.dep.pa.gov/Citizens/My-Water/drinking_water/Pages/default.aspx

Horsham Township

<http://www.Horsham.org/default.aspx>

Warminster Township

<http://warminstertownship.org/information-on-perfluorinated-chemicals-pfoa-and-pfos/>



PFAS Information and Resources (continued)



Horsham Water and Sewer Authority
<https://www.horshamwater-sewer.com>

Warminster Township Municipal Authority
<https://www.warminsterauthority.com/>

Pennsylvania Department of Health
<http://www.health.pa.gov/My%20Health/Environmental%20Health/Pages/default.aspx>

Horsham Township Library Information Repository
<http://oldhtl.mclinc.org/WillowGroveNASindex.html>